

What is claimed is:

1. An air conditioner system to provide cooling or heating to a flexible material-based device, said system comprising:

a ventilated portion located within a flexible material body, said ventilated portion having a flexible material inner layer, a flexible material outer layer and an intermediate layer between said flexible material inner layer and said flexible material outer layer defining a first chamber and a second chamber, said flexible material inner layer and said flexible material outer layer having a plurality of vent openings;

5 at least one thermoelectric module with heat exchangers on opposite sides of said thermoelectric module wherein one of said heat exchangers is in communication with said first chamber and the other of said heat exchangers is in communication with said second chamber;

10 an air stream source incorporated within said flexible material body and positioned to deliver an air stream to said first chamber and said second chamber through said heat exchangers and out said plurality of vent openings; and

15 a DC power source connected to said at least one thermoelectric module and said fan.

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2. The system of Claim 1 further comprising a power switch between said power source and said at least one thermoelectric element to reverse the direction of current flow through said at least one thermoelectric element.

5 3. The system of Claim 1 wherein said DC power source is one or more of batteries, solar power, or fuel cells or any combination thereof.

4. The system of Claim 3 wherein said flexible material body has one or more locations for holding said one or more batteries, solar power, or fuel cells.

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5. A wearable air-conditioned garment to provide a cooling or heating to a wearer, said garment comprising:

a garment body;

a ventilated portion located within said garment body, said ventilated portion

15 having a garment inner layer, a garment outer layer and an intermediate layer between said inner garment layer and said outer garment layer defining a first chamber and a second chamber, said garment inner layer and said garment outer layer having a plurality of vent openings;

at least one thermoelectric module with heat exchangers on opposite sides of

20 said thermoelectric module wherein one of said heat exchangers is in communication with said first chamber and the other of said heat exchangers is in communication with said second chamber;

an air stream source incorporated within said garment and positioned to  
deliver an air stream to said first chamber and said second chamber  
through said heat exchangers and out said plurality of vent openings; and  
a DC power source connected to said at least one thermoelectric module and  
5                   said fan.

6. The garment of Claim 5 further comprising a power switch between said power  
source and said at least one thermoelectric element to reverse the direction of  
current flow through said at least one thermoelectric element.

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7. The garment of Claim 5 wherein said DC power source is one or more of  
batteries, solar power, or fuel cells or any combination thereof.

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8. The garment of Claim 7 wherein said garment body has one or more locations  
for holding said one or more batteries, solar power, or fuel cells.

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9. A portable, wearable air conditioning unit comprising:  
an enclosure adaptably configured to be wearable by a user;  
a thermoelectric module positioned within said enclosure, said thermoelectric  
module configured with heat exchangers on opposite sides of said  
thermoelectric module wherein each of said heat exchangers is positioned  
within separated air streams;

an air flow source in fluid communication with said heat exchangers, said air  
flow source providing an air flow for said separated air streams;  
a plurality of outlet air stream ducts wherein at least one of said plurality of  
outlet air stream ducts is configured to deliver one of said separated air  
streams to said user; and  
5 a DC power source connected to at least said thermoelectric module.

10. The wearable air conditioning unit of Claim 9 wherein said enclosure is  
adaptably configured for incorporation into a garment.

10 11. The wearable air conditioning unit of Claim 9 wherein said DC power source is  
one or more of batteries, solar power, or fuel cells or any combination thereof.

12. The wearable air conditioning unit of Claim 9 wherein said unit has one or more  
15 of shoulder straps, waist belt or fastening clips or any combination thereof.

13. A method of providing a wearable air conditioning unit, said method comprising:  
incorporating a ventilated portion into a garment body, said ventilated portion  
having a garment inner wall, a garment outer wall and an intermediate wall  
20 between said garment inner wall and said garment outer wall forming a  
first chamber and a second chamber, said garment inner wall and said  
garment outer wall having a plurality of vent openings;

positioning at least one thermoelectric module in said garment body, said at  
least one thermoelectric module having heat exchangers on opposite sides  
wherein said heat exchangers are positioned within separated air stream  
ducts wherein one of said separated air stream ducts communicates with  
5       said first chamber and the other of said separated air stream ducts  
communicates with said second chamber;  
providing an air flow to said heat exchangers; and  
powering said thermoelectric module to create a cooling air flow and a heated  
air flow.

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